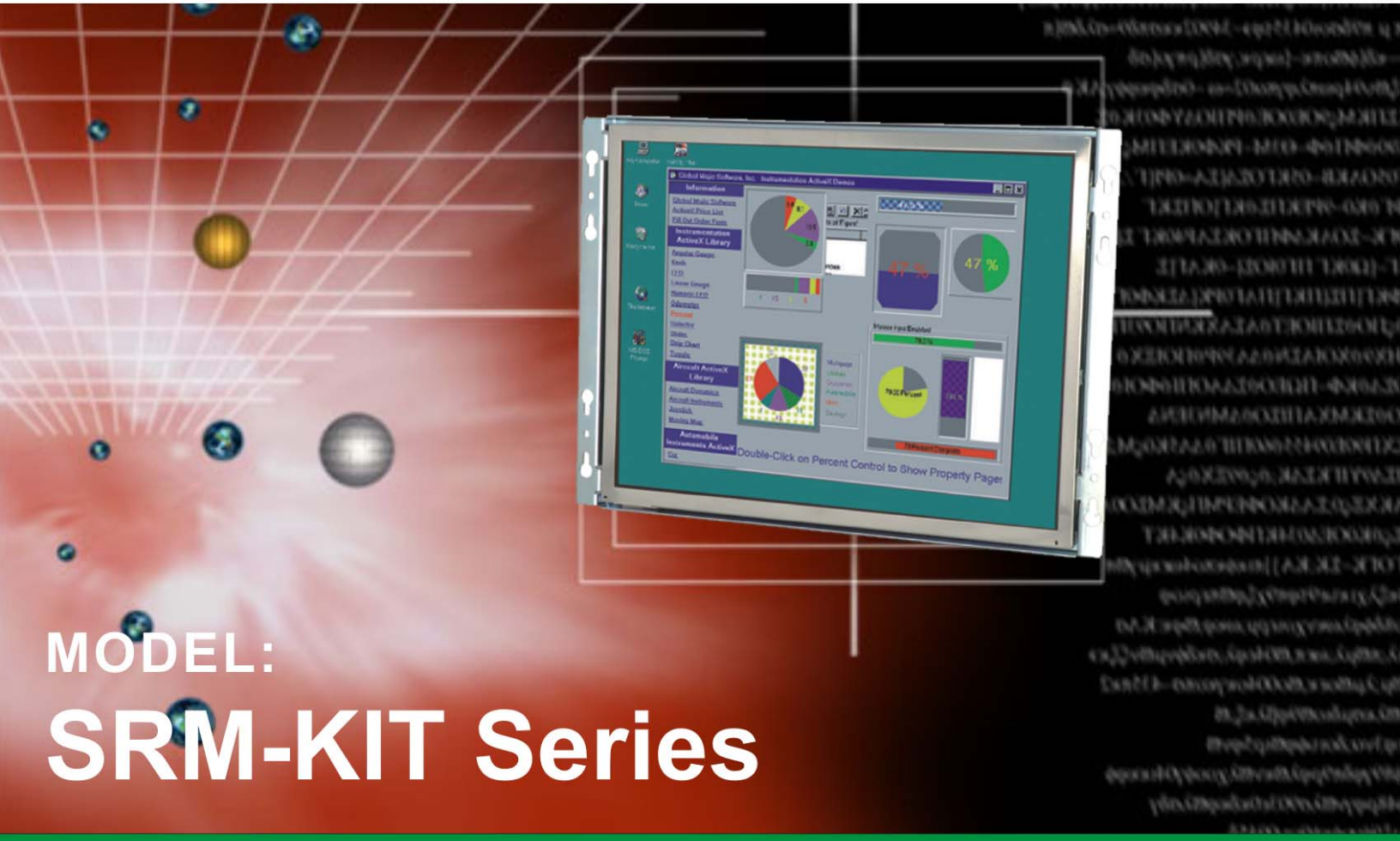
IEI Technology Corp.



MODEL:

SRM-KIT Series

High Brightness Industrial Monitor, RoHS Compliance

Auto-Dimming, OSD Control, VGA, DVI-D, 12V Input

USER MANUAL

Rev. 1.0 January 2007

RoHS Lead Free

Revision

Title	SRM-KIT LCD Monitor User Manual	
Revision Number	**Description**	**Date of Issue**
1.0	Initial release	January 2007

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Packing List

NOTE:

If any of the components listed in the checklist below are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the SRM-KIT from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

The items listed below should all be included in the SRM-KIT package.

- 1 x SRM-KIT121G / SRM-KIT150G industrial LCD monitor
- 1 x 45W AC Power Adapter
- 1 x AC power cable
- 1 x DVI cable
- 1 x VGA cable
- 1 x Screw set
- 1 x User manual and driver CD

Images of the above items are shown in **Chapter 4.2.3**.

Precautions

SAFETY PRECAUTIONS

1. Prior to installing, moving, and modifying the panel PC, make sure that the unit's power is turned off and the power cord is disconnected.
2. Do not apply voltage levels that exceed the specified voltage range. Doing so may cause fire or an electrical shock.
3. Electric shock can occur if the panel is opened. Do not drop or insert any objects into the ventilation openings of the panel PC.
4. Only qualified engineers from certified system integrators or VARs are allowed to make necessary functional modifications to the panel PC, e.g., adding a touch screen. IEI offers the customization service on a pre-order basis.
5. If considerable amount of dust, water, or fluids entered the panel PC, turn off the power supply immediately, unplug the power cord, and contact the vendor.
6. Explosions may occur with installations in environments where flammable gases are present.
7. Fault-tolerant and failsafe designs should be implemented with the use of the series models on transportation vehicles, ships, safety/security devices, or medical devices not related to life-support functionalities. Users/integrators should take the responsibility for implementations with adequate levels of reliability and safety.
8. Preventive designs should be implemented so as to avoid the communications faults between the panel PC and the PC/workstation/terminals that controls it.

HANDLING PRECAUTIONS

1. Do not drop the panel PC against a hard surface. Doing so may damage the display.
2. Do not strike or exert excessive force onto the touch panel.
3. Touching the touch panel using a sharp object may damage the LCD panel.
4. Avoid environments exposed to direct sunlight, dust, or chemical vapors.
5. The panel PC is actively cooled. In no circumstances should the panel PC

operate with the openings obstructed by foreign objects. However, the ambient temperature of the installation site should be observed and controlled to avoid overheating the panel PC.

6. Condensation might form inside the panel PC chassis if exposed to sudden changes in temperature.
7. Carefully route the power cord so that people cannot step on it. Do not place anything over the power cord.
8. If the equipment should be left unused for an extended period of time, disconnect it from the power source to avoid damage by transient over-voltage.
9. If any of the following situations arises, get the equipment checked by service personnel:
   - The power cord or plug is damaged.
   - Liquid has penetrated into the equipment.
   - The equipment has been exposed to moisture.
   - The equipment does not work properly, or the user cannot get it to work according to the user manual.
   - The equipment has been dropped and damaged.
   - The equipment shows obvious signs of breakage.

WARNING!

Any changes or modifications made to the equipment that are not expressly approved by the relevant standards could void the authority to operate the equipment.

MAINTENANCE AND CLEANING

Note the following precautions before beginning to clean the Panel PC.

When cleaning any single part or component of the computer, please read and understand the details below fully.

- Except for the properly installed front LCD panel, never spray or squirt liquids directly onto any computer component. To clean the device, please rub it with

a piece of dry and soft cloth or a slightly moistened cloth with the exterior casing.

- The interior of the Panel PC does not require cleaning. Keep fluids away from the Panel PC and the interior of it.
- Be cautious of the tiny removable components when using a vacuum cleaner to absorb the dirt on the floor.
- Turn the system off before cleaning up the Panel PC.
- Never drop any tiny objects through the openings of the Panel PC or get circuit board damp or wet.
- Be cautious of all kinds of cleaning solvents or chemicals when using it for the sake of cleaning. Some individuals may be allergic to the ingredients.
- Avoid any food, drink or cigarette around the Panel PC.

CLEANING TOOLS

Although many companies have created products to help improve the process of cleaning the computer and peripherals, users can also use household items to clean their computers and peripherals. Below is a list of items to use while cleaning the computer or computer peripherals.

Please keep in mind that some components in the computer may only be cleaned using a product designed for cleaning that component, if this is the case it will be mentioned in the cleaning tips.

- ***Cloth*** - A piece of cloth is the best tool to use when rubbing up a component. Although paper towels or tissues can be used on most hardware as well, it is recommended to rub it with a piece of cloth.
- ***Water or rubbing alcohol*** – Moisten a piece of cloth a bit with some water or rubbing alcohol and rub it on the computer.
- Unknown solvents may be harmful to the plastics parts.
- ***Vacuum cleaner*** - Absorb the dust, dirt, hair, cigarette particles, and other particles out of a computer can be one of the best methods of cleaning a computer. Over time these items can restrict the airflow in a computer and cause circuitry to corrode.
- ***Cotton swabs*** - Cotton swabs moistened with rubbing alcohol or water are

excellent tools for wiping hard to reach areas in the keyboard, mouse, and other locations.

- ***Foam swabs*** - Whenever possible it is better to use lint free swabs such as foam swabs.

ESD PRECAUTIONS

Observe all conventional anti-ESD methods while handling the components contained within the LCD should the need arise for adding a functionality. The use of a grounded wrist strap and an anti-static work pad is recommended. Avoid dust and debris or other static-accumulating materials in the work area.

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Chapter

1

Introduction

1.1 SRM-KIT Series LCD Monitor Overview

The SRM-KIT series industrial monitor is the latest member of IEI's line of sophisticated LCD designs, and it has been improved to be RoHS compliant. The SRM-KIT series is designed to fit industrial automation, or any other applications that require minimum installation space and flexible configuration. The SRM-KIT sunlight readable industrial monitor with the ultra-high brightness and auto-dimming LCD is also suitable for outdoor use. Flexible analog or digital interfaces are provided for ease of connection with a management computer. If remote/non-attentive control is preferred, RS-232 or USB interfaces can be used with customized adapter cables.

1.1.1 Standard Features

All the models listed in **Section 1.2.1** have the following standard features:

- Auto-dimming TFT LCD
- 1000 cd/m^2 high brightness and 50000hrs MTFB long lifetime panel
- Analog VGA and DVI-D input
- RoHS compliance
- Wide range operating temperature
- Wide viewing angle
- High contrast ratio
- Advanced thermal and air-flow design

1.1.2 SRM-KIT Series Industrial Monitor Applications

IEI's series of SRM-KIT are designed for system manufacturers, integrators, or value-added resellers that want to provide all the performance, quality and reliability of an LCD display solution at a cost effective price. IEI's SRM-KIT offers additional components such as cables, an inverter and power supply with controller interfaces that include VGA and DVI.

1.1.3 Model Variations

The SRM-KIT series offers the following model variations.

- SRM-KIT121G: 12.1” LCD screen
- SRM-KIT150G: 15” LCD screen

1.2 External Overview

The SRM-KIT series industrial monitors are durable devices that can be used in harsh industrial environments. The following sections describe the physical layout of the SRM-KIT series industrial monitors.

1.2.1 Front View

The front of the SRM-KIT series monitor is a flat panel TFT LCD screen attached to a metal chassis. **Figure 1-1** shows a typical SRM-KIT front view.

Figure 1-1: Front View

1.2.2 Rear View

The rear of the SRM-KIT series monitor is a metal chassis. An on screen display (OSD) control button panel is located vertically on the left side of the chassis with the following control buttons:

- LCD On/Off
- Auto
- Left
- Right
- Menu

The OSD panel also has one auto-dimming sensor, one power LED and one auto-dimming LED. Refer to **Chapter 5** for a complete description of OSD panel.

Figure 1-2 shows the LCD monitor front view of SRM-KIT121G and SRM-KIT150G.

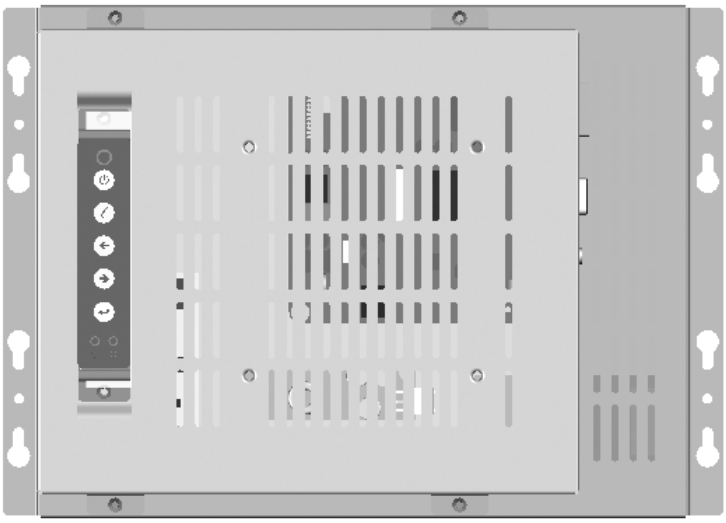

Figure 1-2: Rear View

1.2.3 Connectors

Each SRM-KIT series monitor has a number of interface connectors on the right panel of the chassis (when viewing the rear panel). **Figure 1-3** shows the SRM-KIT series connector panel.

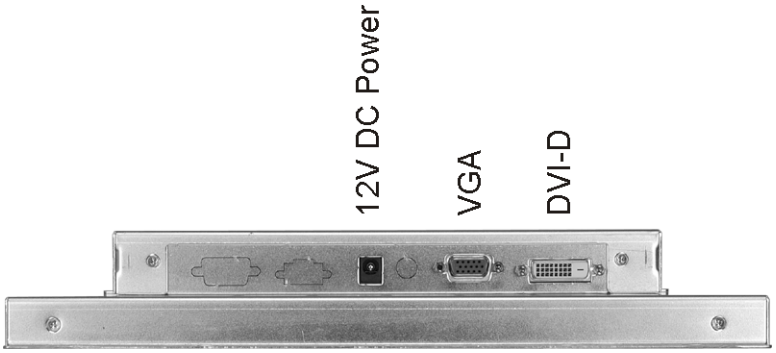

Figure 1-3: SRM-KIT Series Connectors

1.3 AD Board

The SRM-KIT series monitor AD boards provide a wide variety of control interfaces, receiving and managing signals from a CPU card through cabling. **Figure 1-4** shows the AV-5300 AD board as a sample of a typical AD board for the SRM-KIT series monitor. Refer to **Chapter 3** for a complete description of AD boards and their connectors.

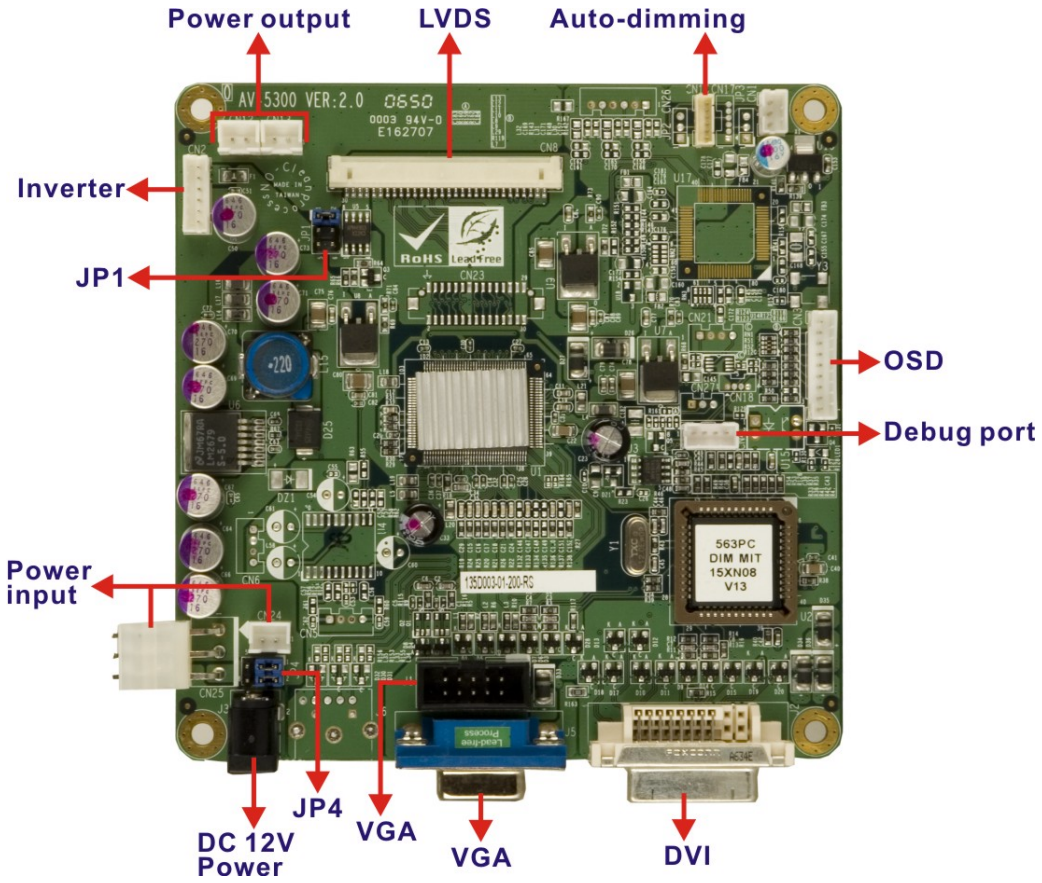

Figure 1-4: AV-5300 AD Board

1.4 Series Specifications

Table 1-1 shows the SRM-KIT Series specifications.

Model	SRM-KIT121G	SRM-KIT150G
LCD Size	12.1”	15”
Input Interface	Analog VGA and DVI-D	
Resolution	800 x 600	1024 x 768
Brightness	1000 cd/m^2	800 cd/m^2
Contrast	700:1	600:1

Model	SRM-KIT121G	SRM-KIT150G
Display Color	262K (6 bit/color) or 16.7M (8 bit/color)	
Pixel Pitch	0.3075 mm	0.297 mm
Chassis	Heavy-duty steel	
View Angle	130 (H)/120 (V)	150 (H)/110 (V)
Input Voltage	12VDC	
OSD Function	Yes	
Mounting	Panel / Arm / Stand	
Dimension (mm)	316 x 224.4 x 47.9	364.1 x 262.5 x 46
Operation Temperature	-10°C~60°C	
Storage Temperature	-20°C~80°C	

Table 1-1: SRM-KIT Series Specifications

1.5 Certification

All SRM-KIT series industrial monitor models comply with the following international standard:

- RoHS

For a more detailed description of the standard, please refer to **Sections A.1**.

1.6 Physical Dimensions

The following sections describe the physical dimensions for the SRM-KIT121GS and SRM-KIT150G industrial monitor.

1.6.1 SRM-KIT121G Physical Dimensions

The physical dimensions of the SRM-KIT121G are shown in **Figure 1-5**.

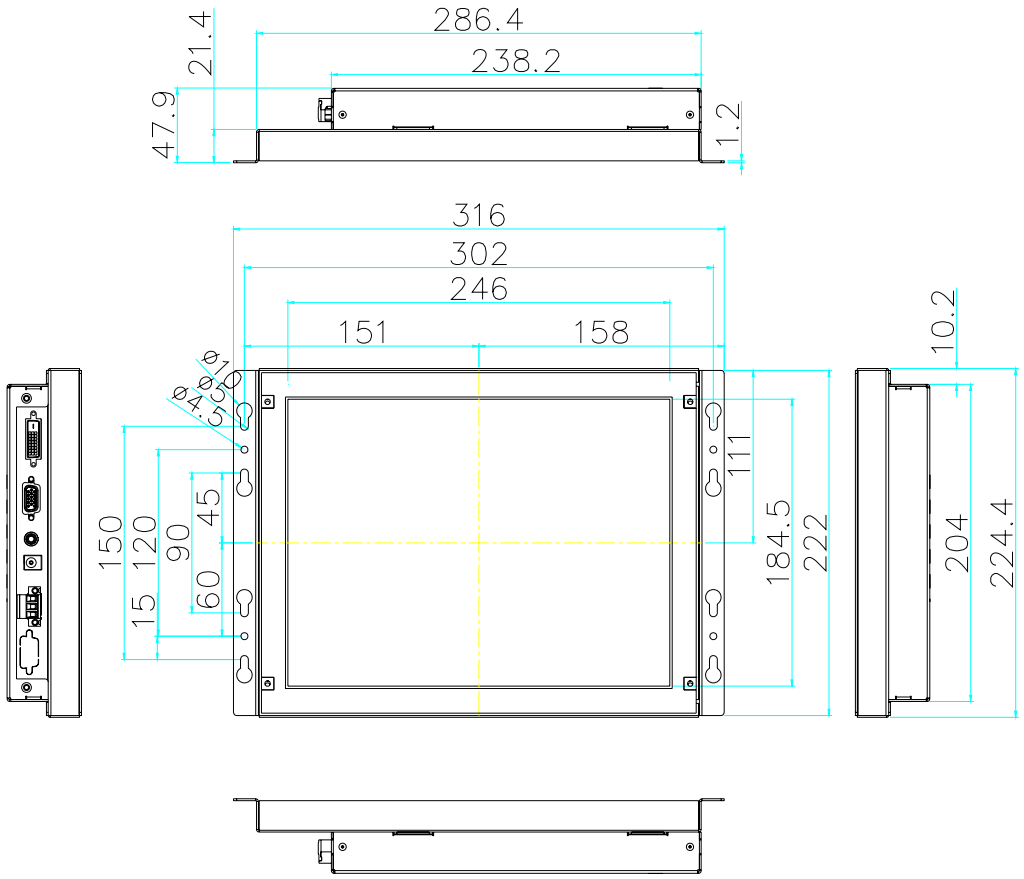

Figure 1-5: SRM-KIT121G Physical Dimensions (millimeters)

1.6.2 SRM-KIT150G Physical Dimensions

The physical dimensions of the SRM-KIT150G are shown in **Figure 1-6**.

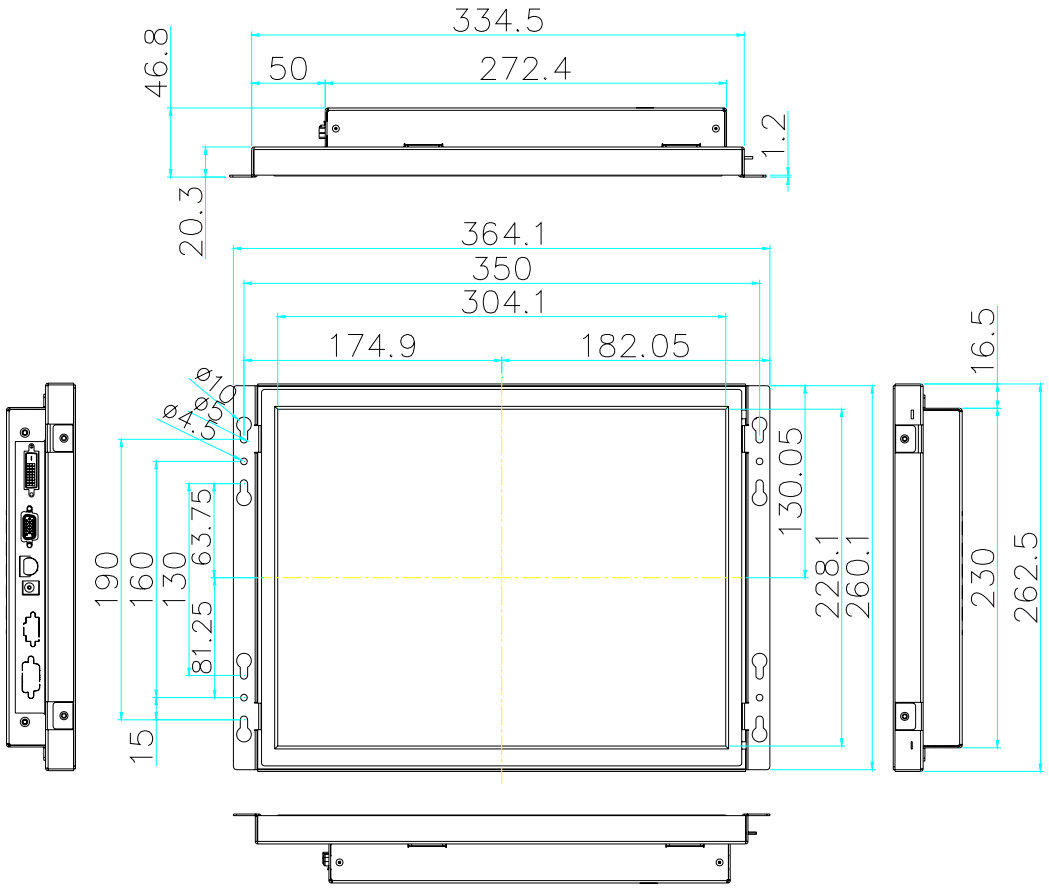

Figure 1-6: SRM-KIT150G Physical Dimensions (millimeters)

1.7 Mounting Options

Each SRM-KIT series monitor has mounting holes located on the mounting bracket and the rear panel. The mounting holes on the mounting bracket are for panel mounting. **Figure 1-7** shows the sizes of the holes on the mounting bracket.

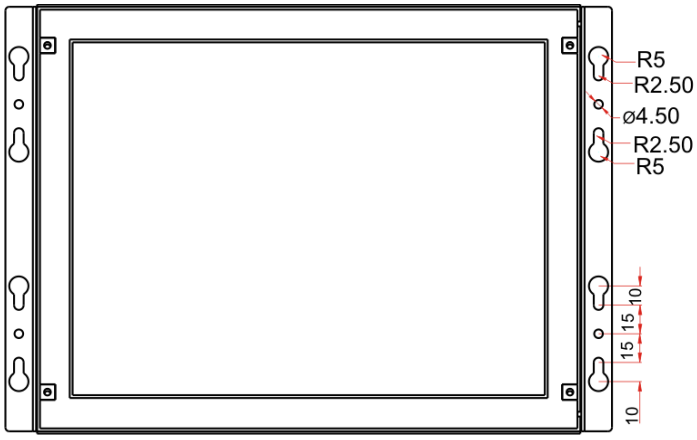

Figure 1-7: Sizes of Mounting Holes

The SRM-KIT series also have four Video Electronics Standards Association (VESA) standard holes located on the rear panel (**Figure 1-8**) for mounting the monitor to a monitor arm or stand.

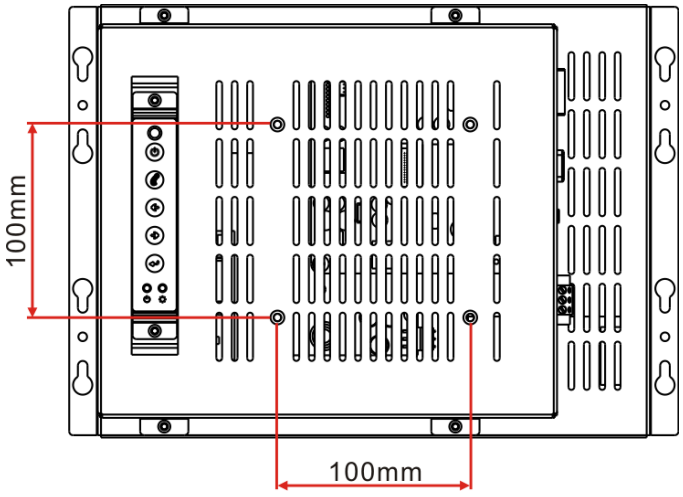

Figure 1-8: Monitor Arm or Stand Mounting

Chapter

2

LCD Specifications

2.1 LCD Specifications

2.1.1 LCD Overview

The SRM-KIT series industrial monitors use the following LCD panels.

- **SRM-KIT121G**: MITSUBISHI AA121SN02 SVGA TFT LCD
- **SRM-KIT150G**: MITSUBISHI AA150XN08 XGA TFT LCD

Detailed specifications for the LCD screens are listed in the following sections.

2.1.2 SRM-KIT121G LCD Specifications

Table 2-1 lists the LCD specifications of the SRM-KIT121G.

Model	SRM-KIT121G
Size	12.1”
MFR/Model	MITSUBISHI AA121SN02
Resolution	SVGA (800 x 600)
Display Area (mm)	246.0 x 184.5
Pixel Pitch (mm)	0.3075 x 0.3075
Number of Colors	262K(6 bit/color), 16.7M(8 bit/color)
View Angle (H/V)	130 / 120
Brightness (cd/m^2)	1000
Contrast Ratio	700:1
Response Time (ms)	T_R: 10 T_F: 30
Interface	LVDS (6 bit/8 bit)
Input Voltage (V)	3.3V
Backlight	4 CCFL

Power Supply Voltage for LCD	3.3V / 3.6V (Max.)
Power Supply Current for LCD	300mA / 450mA
Lamp Voltage/Current	Voltage: 540 Vrms Current: 12.0 mArms/14.0 mAms (Max.)
Starting Lamp Minimum Voltage	1000 Vrms (25°C)/ 1200 Vrms (0°C)/ 1290 Vrms (-20°C)
Operating Temperature	-20°C ~70°C
Operating Humidity	5%~90% RH.
Storage Temperature	-20°C ~80°C
Shock Level (Non-operation)	1470 m/s^2 (100G), Waveform 2ms.
Vibration Level (Non-operation)	9.8 m/s^2 (1.0G) zero to peak, frequency range 5-500Hz sweep rate 0.5 octave/min
Lamp Life (hrs)	50,000

Table 2-1: SRM-KIT121G LCD Specifications

2.1.3 SRM-KIT150G LCD Specifications

Table 2-2 lists the LCD specifications of the SRM-KIT150G.

Model	**SRM-KIT150G**
Size	15”
MFR/Model	MITSUBISHI AA150XN08
Resolution	XGA (1024 x 768)
Active Area (mm)	246.0 x 184.5
Pixel Pitch (mm)	0.297 x 0.297
Number of Colors	262K(6 bit/color), 16.7M(8 bit/color)

View Angle (H/V)	150 / 110
Brightness (cd/m2)	800
Contrast Ratio	600:1
Response Time (ms)	T_R: 6 T_F: 19
Interface	LVDS (6 bit/8 bit)
Input Voltage (V)	3.3V
Backlight	4 CCFL
Power Supply Voltage for LCD	3.3V / 3.6V (Max.)
Power Supply Current for LCD	410mA / 700mA
Lamp Voltage/Current	Voltage: 620 Vrms/2500 Vrms (Max.) Current: 6.5 mArms/8.0 mAms (Max.)
Starting Lamp Minimum Voltage	1300 Vrms (25°C)/ 1500 Vrms (0°C)/ 1650 Vrms (-20°C)
Operating Temperature	-20°C ~70°C
Operating Humidity	5%~90% RH.
Storage Temperature	-20°C ~80°C
Shock Level (Non-operation)	980 m/s^2 (100G), Waveform 2ms.
Vibration Level (Non-operation)	9.8 m/s^2 (1.0G) zero to peak, frequency range 5-500Hz sweep rate 0.5 octave/min
Lamp Life (hrs)	50,000

Table 2-2: SRM-KIT150G LCD Specifications

2.2 Power Adapters

Table 2-3 lists the AC/DC power adapter specifications.

Power	45 Watt AC/DC Adapter
General Description	Universal Input 90 to 264 VAC EMI Meets FCC/CISPR 22 Class B MTBF 165Khrs Limited Power Source
Input Voltage Range	90-264VAC
Input Frequency	47-63 Hz
Inrush Current	40A max. (Cold Start)
Hold-up Time	10mS typical
Leakage Current	0.5mA max.
Short Circuit Protection	Continuous
Over-voltage Protection	Yes
Continuous Output Power	45W max.
Hi-pot Isolation: **Input / Output**	4242VDC

Table 2-3: Power Adapter Specifications

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Chapter

3

AD Board

3.1 AV-5300 AD Board Overview

The SRM series industrial monitor AD board provides a wide variety of control interfaces, receiving and managing interface signals from a CPU card through cabling. The following sections describe the AV-5300 AD board in detail.

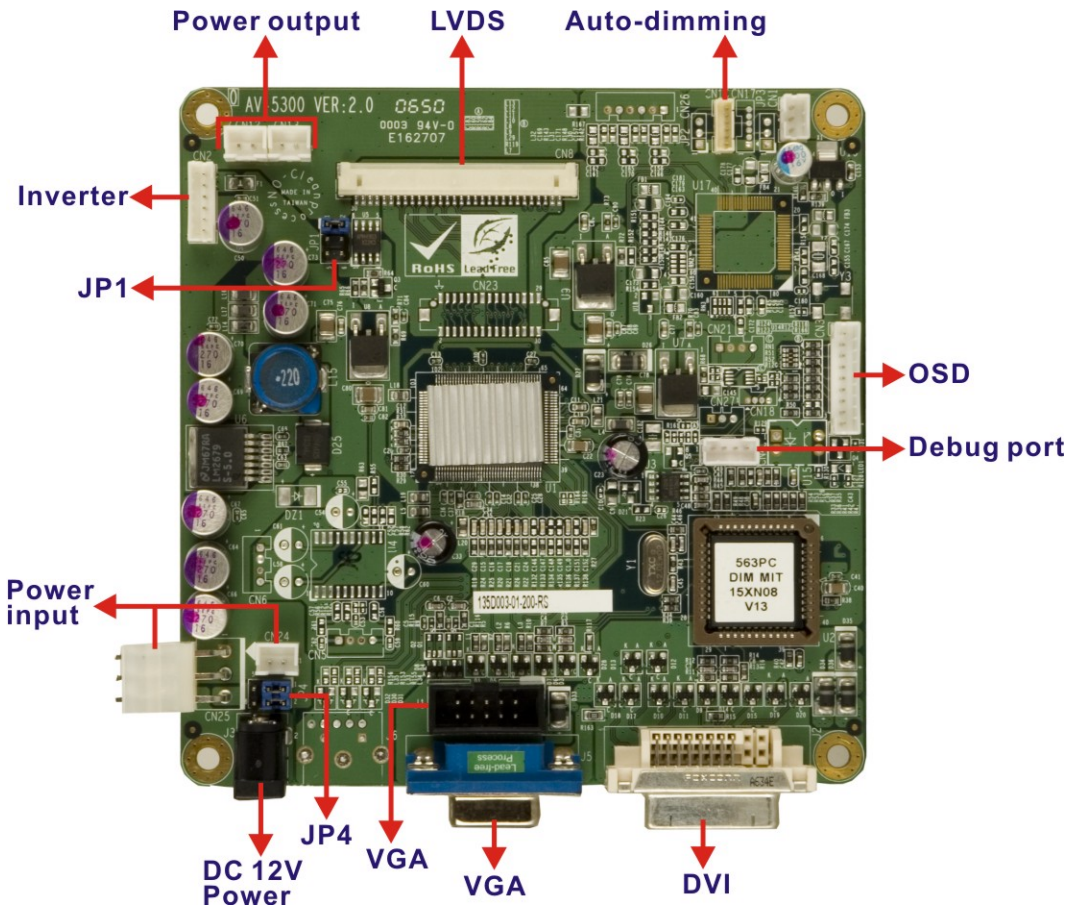

Figure 3-1: AV-5300 AD Board Overview

3.1.1 AV-5300 AD Board Connectors

The AV-5300 AD board has the following connectors on-board:

- 1 x Auto-dimming connector
- 1 x Debug connector
- 1 x External OSD and LED Indication connector
- 1 x Inverter interface connector
- 1 x LVDS connector
- 2 x Power output connector
- 2 x Power input connector
- 1 x VGA connector

The AV-5300 AD board has the following connectors on the board rear panel:

- 1 x 12V DC power connector
- 1 x DVI connector
- 1 x VGA connector

The locations of the peripheral interface connectors for the AV-5300 AD board are shown in **Section 3.1.2**. A complete list of all the peripheral interface connectors can be seen in **Section 3.1.3**.

3.1.2 AV-5300 AD Board Layout

Figure 3-2 shows the on-board peripheral connectors and on-board jumpers.

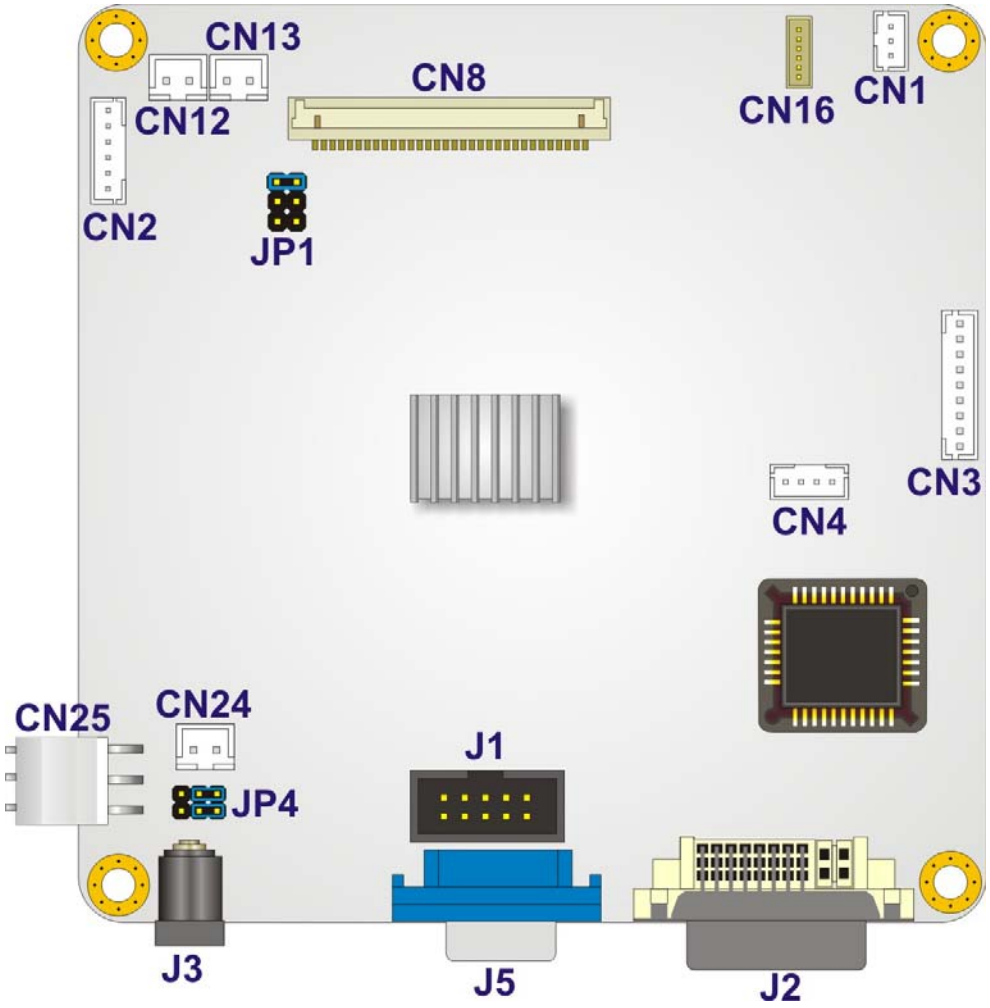

Figure 3-2: Connector and Jumper Locations

3.1.3 AV-5300 Peripheral Interface Connectors

Table 3-1 shows a list of the peripheral interface connectors on the AV-5300 AD board. Detailed descriptions of these connectors can be found in **Section 3.2**.

Connector	Type	Label
Auto-dimming connector	6-pin wafer connector	CN16
Debug connector	4-pin wafer connector	CN4
External OSD and LED Indication connector	9-pin wafer connector	CN3
Inverter interface connector	6-pin wafer connector	CN2
LVDS connector	30-pin connector	CN8
Power output connectors	2-pin wafer connector	CN12, CN13
Power input connectors	3-pin wafer connector	CN24. CN25
VGA connector	10-pin box header	J1

Table 3-1: AV-5300 Peripheral Interface Connectors

3.1.4 AV-5300 Rear Panel Connectors

Table 3-2 lists the rear panel connectors on the AV-5300 AD board. Detailed descriptions of these connectors can be found in **Section 3.4**.

Connector	Type	Label
12V DC power connector	DC Power Jack	J3
DVI connector	24-pin DVI-D connector	J2
VGA connector	15-pin VGA connector	J5

Table 3-2: AV-5300 Rear Panel Connectors

3.1.5 AV-5300 On-board Jumpers

Table 3-3 lists the on-board jumpers. A detailed description of these jumpers can be found in **Section 3.3.**

Jumper	Type	Label
LCD Panel Power Input Select	6-pin header	JP4
LCD Panel Voltage Select	6-pin header	JP1

Table 3-3: AV-5300 On-board Jumpers

3.2 AV-5300 Internal Peripheral Connectors

Internal peripheral connectors on the AV-5300 AD board are only accessible when the board is outside of the monitor. This section has complete descriptions of all the internal, peripheral connectors on the AV-5300 AD board.

3.2.1 Auto-Dimming Connector

CN Label: CN16

CN Type: 6-pin wafer connector

CN Pinouts: See Table 3-4

CN Location: See Figure 3-3

The auto-dimming connector connects to an external auto-dimming sensor.

PIN	DESCRIPTION
1	+3.3V
2	NC
3	GND
4	SCL
5	NC
6	SDA

Table 3-4: Auto-dimming Connector Pinouts

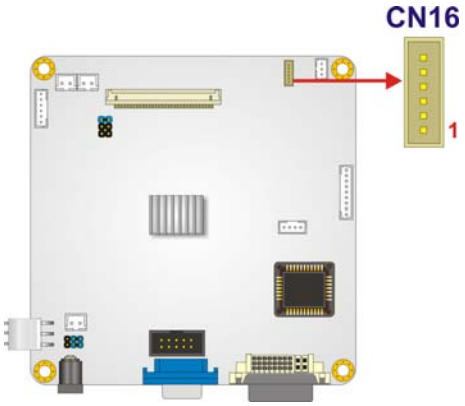

Figure 3-3: Auto-dimming Connector Location

3.2.2 Debug Port Connector

CN Label: CN4

CN Type: 4-pin wafer connector

CN Pinouts: See Table 3-5

CN Location: See Figure 3-4

Use the debug port connector to update the AD board BIOS.

PIN	DESCRIPTION
1	+5V
2	TX
3	RX
4	GND

Table 3-5: Debug Port Connector Pinouts

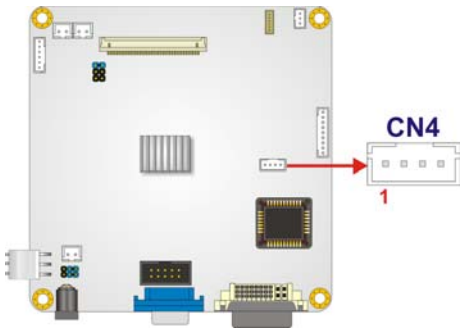

Figure 3-4: Debug Port Connector Location

3.2.3 External OSD and LED Indication Connector

CN Label: CN3

CN Type: 9-pin wafer connector

CN Pinouts: See Table 3-6

CN Location: See Figure 3-5

The External OSD and LED Indication connector connects to an external OSD controller.

PIN	DESCRIPTION
1	LED_ORANGE
2	LED_SENSOR
3	LED_GREEN
4	MENU/ENTER
5	RIGHT
6	LEFT
7	AUTO/EXIT
8	LCD ON/OFF
9	GND

Table 3-6: External OSD and LED Indication Connector Pinouts

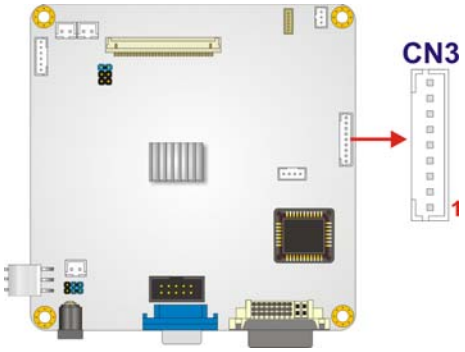

Figure 3-5: External OSD and LED Indication Connector Location

3.2.4 Backlight Inverter Connector

CN Label: CN2

CN Type: 6-pin wafer connector

CN Pinouts: See Table 3-7

CN Location: See Figure 3-6

The Inverter connector connects to the LCD backlight. Using the BKLT_EN signal to control the inverter status (ON/OFF) and the BKLT_ADJ signal to adjust brightness of inverter by OSD brightness function. The OSD brightness function can control a PWM input and variable DC voltage to minimize flickering (due to the interference between panel timing and inverter's AC timing), and adjust LCD back light brightness.

PIN	DESCRIPTION
1	+12V
2	+12V
3	BKLT_EN
4	BKLT_ADJ
5	GND
6	GND

Table 3-7: Backlight Inverter Connector Pinouts

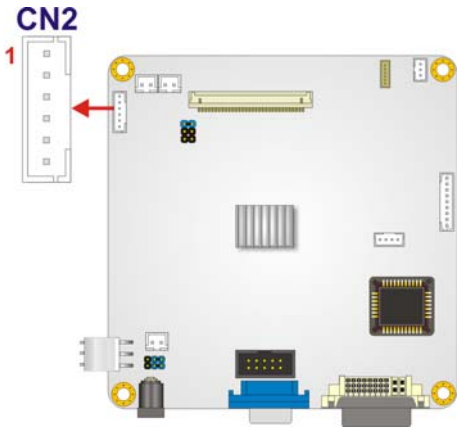

Figure 3-6: Backlight Inverter Connector Location

3.2.5 LVDS Output Connector

CN Label: CN8

CN Type: 30-pin connector

CN Pinouts: See Table 3-8

CN Location: See Figure 3-7

Use either LVDS output connector to connect the LCD panel to a system.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	GND	2	GND
3	TXO3+	4	TXO3-
5	TXOC+	6	TXOC-
7	TXO2+	8	TXO2-
9	TXO1+	10	TXO1-
11	TXO0+	12	TXO0-
13	GND	14	GND
15	TXE3+	16	TXE3-
17	TXEC+	18	TXEC-
19	TXE2+	20	TXE2-
21	TXE1+	22	TXE1-

23	TXE0+	24	TXE0-
25	GND	26	GND
27	VDD	28	VDD
29	VDD	30	VDD

Table 3-8: LVDS Output Connector Pinouts

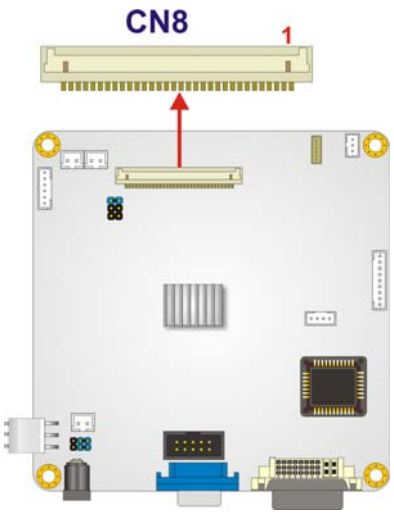

Figure 3-7: LVDS Output Connector Location

NOTE:

The supply voltage (3.3V (Default), 5V or 12V) can be selected via JP1.

3.2.6 Power Output Connector

CN Label: CN12, CN13

CN Type: 2-pin wafer connector

CN Pinouts: See Table 3-9 and Table 3-10

CN Location: See Figure 3-8

The AV-5300 supports two power output connectors, one for 12V and the other for 5V.

PIN	DESCRIPTION
1	+12V
2	GND

Table 3-9: Power Output Connector Pinouts (CN12)

PIN	DESCRIPTION
1	+5V
2	GND

Table 3-10: Power Output Connector Pinouts (CN13)

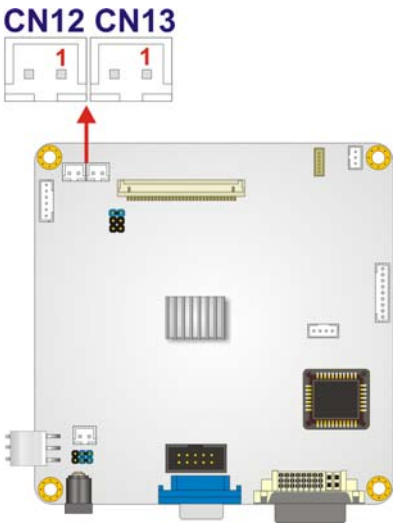

Figure 3-8: Power Output Connector Locations

3.2.7 Power Input Connector

CN Label: CN24, CN25

CN Type: 2-pin wafer connector, 3-pin wafer connector

CN Pinouts: See Table 3-11 and Table 3-12

CN Location: See Figure 3-9

The AV-5300 supports two internal power input connectors.

PIN	DESCRIPTION
1	+12V
2	GND

Table 3-11: Power Input Connector Pinouts (CN24)

PIN	DESCRIPTION
1	+12V Input
2	GND
3	+24V to external power module

Table 3-12: Power Input Connector Pinouts (CN25)

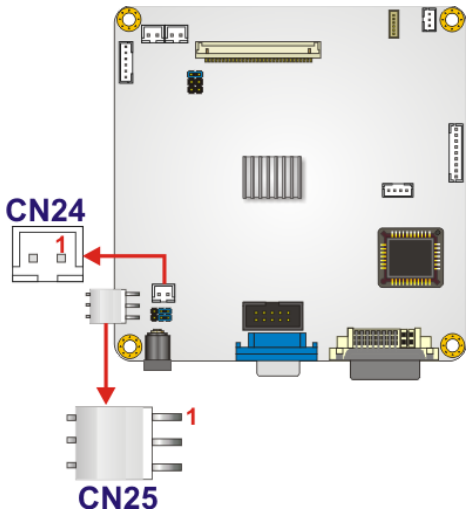

Figure 3-9: Power Input Connector Locations

3.2.8 VGA Connector

CN Label: J1

CN Type: 10-pin box header

CN Pinouts: See Table 3-13

CN Location: See Figure 3-10

In addition to the standard DB-15 female VGA connector (J1), a VGA connection can also be made through the on-board CN2 10-pin header.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	RED	2	SMCLK
3	GREEN	4	SMDATA
5	BLUE	6	GROUND
7	HSYNC	8	GROUND
9	VSYNC	10	GROUND

Table 3-13: VGA Connector Pinouts

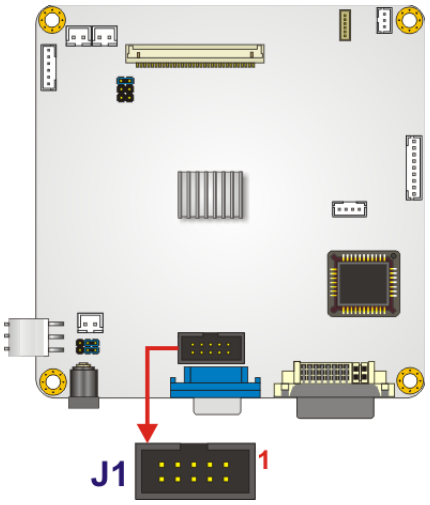

Figure 3-10: VGA Connector Location

3.3 AV-5300 On-board Jumpers

NOTE:

A jumper is a metal bridge used to close an electrical circuit. It consists of two or three metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To CLOSE/SHORT a jumper means connecting the pins of the jumper with the plastic clip and to OPEN a jumper means removing the plastic clip from a jumper.

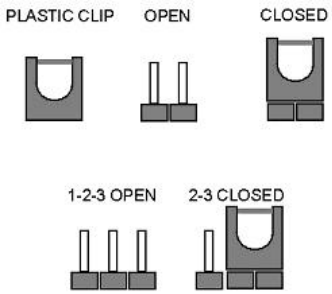

Figure 3-11: Jumpers

The AV-5300 has two on-board jumpers (**Table 3-3**).

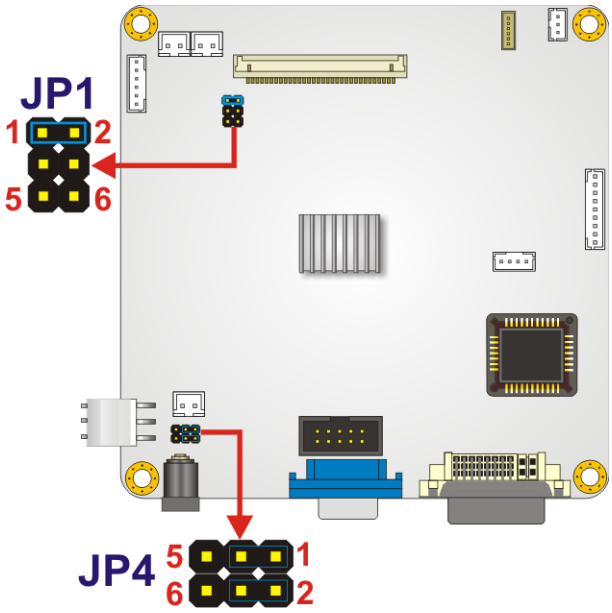

Figure 3-12: Jumper Locations

3.3.1 LCD Panel Power Input Jumper

Jumper Label: JP4

Jumper Type: 6-pin header

Jumper Location: See Figure 3-12

Jumper Settings: See Table 3-14

The JP4 jumper sets the input source from either the 12V power connector (J3) or the external terminal block.

JP4	Description
1-3, 2-4	+12V from power connector (J3) (Default)
3-5, 4-6	Input with external connector (Need external power module)

Table 3-14: LCD Panel Power Input Jumper Settings

3.3.2 LCD Panel Voltage Select Jumper

Jumper Label: JP1

Jumper Type: 6-pin header

Jumper Location: See Figure 3-12

Jumper Settings: See Table 3-15

The JP1 jumper sets the voltage to the LCD panel.

JP1	Description
1-2	Panel Voltage select 3.3V (Default)
3-4	Panel Voltage select 5V
5-6	Panel Voltage select 12V

Table 3-15: LCD Panel Voltage Select Jumper Settings

3.4 AV-5300 External (Rear Panel) Connectors

Figure 3-13 shows the AV-5300 external (rear panel) connectors. The peripheral connectors on the back panel of the monitor can connect to external devices. The peripheral connectors on the rear panel are:

- 1 x DC 12V connector
- 1 x DVI-D connector
- 1 x VGA connector

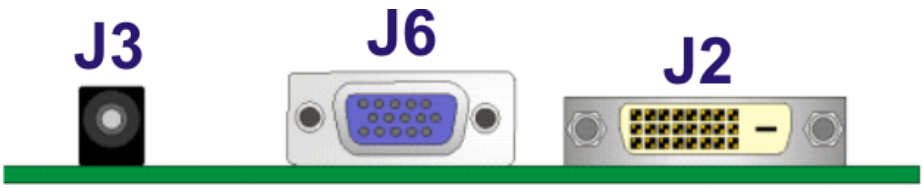

Figure 3-13: AV-5300 External (Rear Panel) Connectors

3.4.1 DC 12V Connector

CN Label: J3

CN Type: DC 12V Jack

CN Pinouts: See Table 3-16

CN Location: See **Figure 3-13**

Use the DC 12V connector to power the monitor.

PIN	DESCRIPTION
1	GND
2	GND
3	DC 12V

Table 3-16: DC 12V Connector Pinouts

3.4.2 VGA Connector

CN Label: J5

CN Type: D-sub 15 female connector

CN Pinouts: See Table 3-17 and Figure 3-14

CN Location: See **Figure 3-13**

Use the standard D-sub 15-pin VGA connector to connect the monitor to a system.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	Red	9	No Connect
2	Green	10	Ground
3	Blue	11	No Connect
4	No Connect	12	DDC DAT
5	Ground	13	Horizontal Synchronization
6	Ground	14	Vertical Synchronization
7	Ground	15	DDC Clock
8	Ground		

Table 3-17: VGA Connector Pinouts

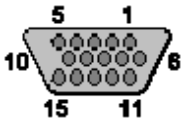

Figure 3-14: VGA Connector Pinout Locations

3.4.3 DVI-D Connector

CN Label: J2

CN Type: D-sub DVI female connector

CN Pinouts: See Table 3-18 and Figure 3-15

CN Location: See **Figure 3-13**

The 24-pin female dual link digital only DVI [Digital Visual Interface] connector is a standard for high-speed, high-resolution digital displays. Use the DVI-D connector to connect the LCD to a system.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	RX2-	2	RX2+
3	GND	4	NC
5	NC	6	DVI-SCL
7	DVI-SDA	8	NC
9	RX1-	10	RX1+
11	GND	12	NC
13	NC	14	DVI-5V
15	GND	16	HOT-PLUG
17	RX0-	18	RX0+
19	GND	20	NC
21	NC	22	GND
23	RXC+	24	RXC-

Table 3-18: DVI-D Connector Pinouts

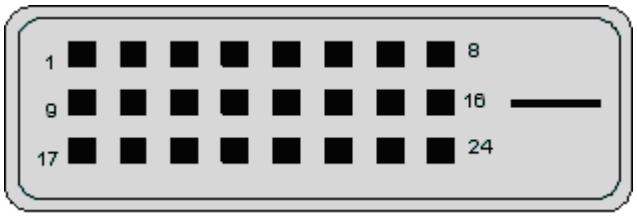

Figure 3-15: DVI-D Connector Pinout Locations

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Chapter

4

Installation

4.1 Installation Precautions

When installing the SRM-KIT series industrial monitor, please follow the precautions listed below:

- **Read the user manual**: The user manual provides a complete description of the SRM-KIT series industrial monitor, installation instructions and configuration options.
- **DANGER! Disconnect Power**: Power to the monitor must be disconnected when installing the SRM-KIT series industrial monitor, or before any attempt is made to access the rear panel. Electric shock and personal injury might occur if the rear panel of the monitor is opened while the power cord is still connected to an electrical outlet.
- **Qualified Personnel**: The SRM-KIT series industrial monitor must be installed and operated only by trained and qualified personnel. Maintenance, upgrades, or repairs may only be carried out by qualified personnel who are familiar with the associated dangers.
- **Mounting**: Since the monitor may weigh up to 10 kg (not including a swing arm or other accessories), please ensure at least two people assist with mounting the monitor.
- **Air Circulation**: Make sure there is sufficient air circulation when installing the monitor. The monitor's cooling vents must not be obstructed by any objects. Blocking the vents can cause overheating of the monitor. Leave at least 5 cm of clearance around the monitor to prevent overheating.
- **Grounding**: The monitor should be properly grounded. The voltage feeds must not be overloaded. Adjust the cabling and provide external overcharge protection per the electrical values indicated on the label attached to the back of the monitor.
- **Anti-static Discharge**: The rear panel of the monitor must to be removed to configure the monitor's AD board voltage select jumper. When doing so, be sure the monitor is disconnected from its power source and take all necessary safety precautions to avoid electrocution and static discharge to the AD board. The use of a grounded wrist strap and an anti-static work pad is recommended.

4.2 Unpacking

4.2.1 Packaging

When shipped, the SRM-KIT series industrial monitor is wrapped in a plastic bag. Two polystyrene ends are placed on either side of the monitor. The monitor is then placed into a first (internal) cardboard box. This box is then sealed and placed into a second (external) cardboard box. The second box is also sealed. A bag containing accessory items is placed underneath the monitor, at the bottom of the internal (first) box.

4.2.2 Unpacking Procedure

To unpack the SRM-KIT series industrial monitor, follow the steps below:

WARNING:

The front side LCD screen has a protective plastic cover stuck to the screen. Only remove the plastic cover after the SRM-KIT series industrial monitor has been properly installed. This ensures the screen is protected during the installation process.

Step 1: Use box cutters, a knife or a sharp pair of scissors to open the seal on the top side of the external (second) box.

Step 2: Open the external (second) box.

Step 3: Use box cutters, a knife or a sharp pair of scissors the seal on the top side of the internal (first) box.

Step 4: Lift the monitor out of the boxes.

Step 5: Remove both polystyrene ends, one from each side.

Step 6: Pull the plastic cover off the SRM-KIT series industrial monitor.

Step 7: Make sure all the components listed in the packing list are present.

4.2.3 Packing List

All the monitors in the SRM-KIT series are shipped with the following components:

Quantity	Item	Image
1	45W AC power adapter	
1	AC power cord	
1	DVI cable	
1	Screw kit	
1	VGA cable	
1	User manual and driver CD	

If any of these items are missing or damaged, contact the distributor or sales representative immediately.

4.3 Pre-installation Preparation

4.3.1 Tools

Before installing the SRM-KIT series industrial monitor, make sure the following tools are on hand:

- **Phillips (crosshead) screwdriver**: All the retention screws on the system are Phillips screws.

- **Soft working mat**: When the SRM-KIT series industrial monitor is installed, the screen is placed on the working surface. It is therefore important to rest the MPC industrial workstation on a soft at that cannot damage the LCD screen on the front of the SRM-KIT series industrial monitor.

4.3.2 Voltage Select Jumper Settings

If the monitor comes with both 12V and 9 ~ 36V DC power connectors, the voltage select jumper on the integrated AD board must be configured for the DC connector that is used to power the monitor. Refer to **Section 3.3.2** for the appropriate jumper settings of the AD board.

NOTE:

The default voltage select jumper is configured for a 12V power source.

Do not change the jumper setting unless a 9~36V DC power connector is to be used as the monitor's power source.

To properly set the voltage select jumper, the following steps must be completed:

Step 1: Use a screwdriver to remove all the screws holding the rear panel to the monitor.

Step 2: Remove the rear panel.

Step 3: Locate the voltage select jumper. (See **Section 3.3.2**)

Step 4: Use the jumper(s) to set the correct voltage input. (See **Section 3.3.2**) Replace the rear panel.

Step 5: Replace all removed screws.

4.4 Connectors

Table 4-1 lists the external peripheral interface panel connectors for the SRM-KIT series industrial monitors.

	SRM-KIT121G	SRM-KIT150G
VGA	Yes	Yes
DVI-D	Yes	Yes
Power (12V Jack)	Yes	Yes

Table 4-1: External Peripheral Interface Connectors

4.4.1 VGA Connector

Use the rear panel standard 15-pin female VGA connector to connect the monitor to the system graphics interface.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	Red	9	No Connect
2	Green	10	Ground
3	Blue	11	No Connect
4	No Connect	12	DDC DAT
5	Ground	13	Horizontal Synchronization
6	Ground	14	Vertical Synchronization
7	Ground	15	DDC Clock
8	Ground		

Table 4-2: VGA Connector Pinouts

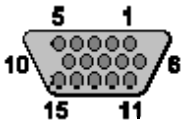


Figure 4-1: VGA Connector Pinout Locations

4.4.2 DVI-D Connector

Use the rear panel standard 24-pin female DVI-D connector to connect the monitor to the system graphics interface.

PIN	DESCRIPTION	PIN	DESCRIPTION	PIN	DESCRIPTION
1	TMDS Data2-	9	TMDS Data1-	17	TMDS Data0-
2	TMDS Data2+	10	TMDS Data1+	18	TMDSData0+
3	TMDS Data2/4 Shield	11	TMDS Data1/3 Shield	19	TMDS Data0/5 Shield
4	TMDS Data4-	12	TMDS Data3-	20	TMDS Data5-
5	TMDS Data4+	13	TMDS Data3+	21	TMDS Data5+
6	DDC Clock [SCL]	14	+5 V Power	22	TMDS Clock Shield
7	DDC Data [SDA]	15	Ground (for +5 V)	23	TMDS Clock +
8	Analog vertical sync	16	Hot Plug Detect	24	TMDS Clock -

Table 4-3: DVI-D Connector Pinouts

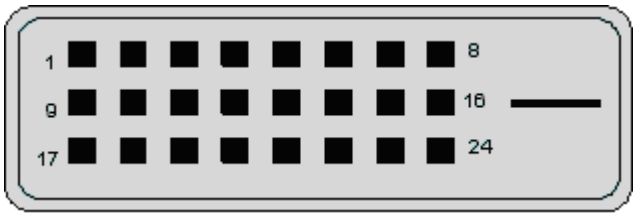


Figure 4-2: DVI-D Connector Pinout Locations

4.4.3 12V Power Connector

Use the rear panel +12V DC jack to connect the monitor to a power source.

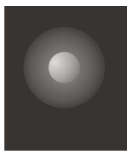


Figure 4-3: 12V Power Connector

4.5 Mounting the SRM-KIT Series LCD Monitor

Each SRM-KIT series monitor comes with a preinstalled mounting bracket with a number of holes available for mounting purposes that system integrators will find especially useful. Refer to **Sections 1.7** for further details on the number and location of mounting holes for each model of the SRM-KIT series monitor.

Chapter

5

On-Screen-Display (OSD) Controls

5.1 User Mode OSD Structure

5.1.1 OSD Buttons

There are several on-screen-display (OSD) control buttons oriented vertically and temporarily along the right hand side of the monitor rear panel. The user can reposition the OSD panel to fit their needs. To make the auto-dimming function properly, please install the OSD panel at a place where no obstacle blocks ambient light sensor. **Figure 5-1** shows a typical arrangement of OSD controls.

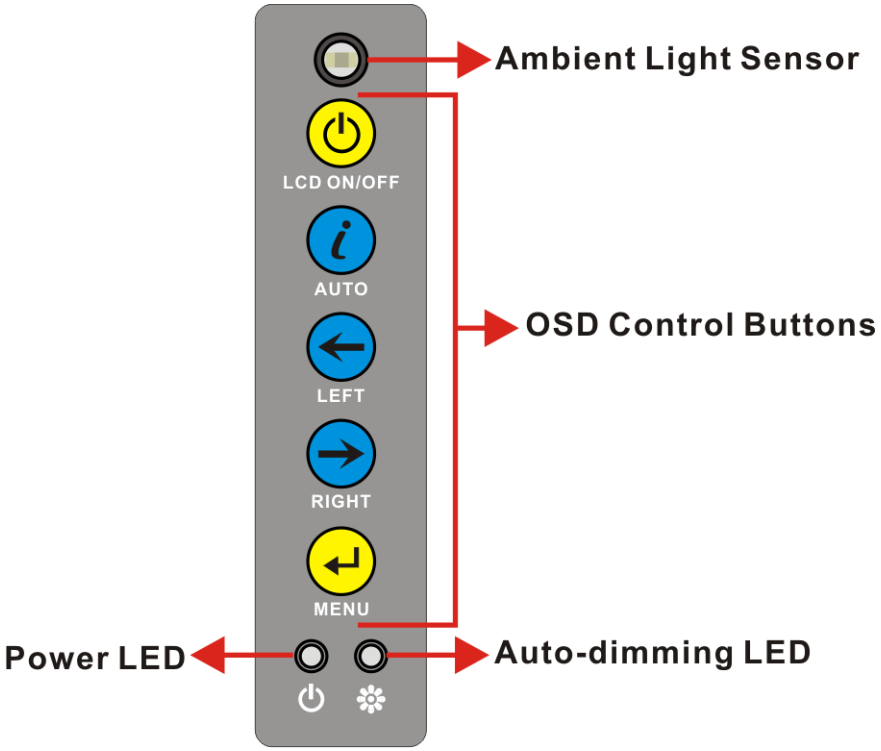


Figure 5-1: OSD Control Buttons for All Models

- **LCD ON/OFF Button**
  Press this button to turn the LCD monitor on or off. When the LCD monitor is on, the power LED is turned on in green.
- **Auto/Exit Button**
  Press this button to enable auto-configuration or apply default values.
- **Left Button**
  Press this button to scroll to the left, to increase the value, or to switch from

one selected item to another.

- **Right Button**
  Press this button to scroll to the right, to decrease the value, or to switch from one selected item to another.
- **Menu/Enter Button**
  Press this button to open the OSD window. When inside a menu, press this button to confirm the function adjustment or selection of the item. There may be several levels in one item. As you select an item in the menu, the sub-items will be displayed.

The OSD control panel also includes one sensor and two LED.

- **Ambient Light Sensor**
  The ambient light sensor detects the brightness of ambient environment when the auto-dimming function is turned on.
- **Power LED**
  The power LED is turned on in green when the LCD monitor is on.
- **Auto-dimming LED**
  The auto-dimming LED is turned on in red when the auto-dimming function is on.

5.1.2 OSD Menu Structure

Table 5-1 shows the OSD menu structure for all models of the SRM-KIT series LCD monitor.

Level 0	Level 1	Value
Main Display Features Menu	Brightness	0 to 100
	Contrast	0 to 100
	Sharpness	1 to 5
Speaker Menu	Volume	This menu is currently disabled, and will be implemented with models equipped with speakers.
	Mute	
	Gamma	Off, On
Color Menu	9300K	- Preset NTSC value
	7500K	- Preset NTSC value

	6500K	- Preset NTSC value
	User Temp	RGB values from 0 to 100
Image Setting Menu	Auto Color	Select
	Width	0 to 100
	Phase	0 to 100
	H. Position	0 to 100
	V. Position	0 to 100
OSD Menu	OSD Time Out	0 to 60 sec
	OSD Position	1 to 5
	Factory Reset	Select
Signal Menu	Digital	Select
	Analog	
Auto-Dimming Menu	Light Enable	Off, On
	Light Max	0 to 100
	Light Min	0 to 100
	LUX Max	0 to 400
	LUX Min	0 to 400

Table 5-1: OSD Menus

5.2 Using the OSD

OSD menu options are described below.

5.2.1 Main Display Features

Main display features are shown in **Figure 5-2**.

Figure 5-2: Main Display Features

Brightness	The brightness option adjusts the brightness of screen. This function adjusts the offset value of ADC. Setting this value too high or too low will affect the quality of image. When the auto-dimming function is turned on, the brightness control is not effective.
Contrast	This function adjusts the gain value of ADC. Adjusting this value too high or too low will worsen the quality of image.
Horizontal Size	This item adjusts the screen size in the horizontal direction.

5.2.2 Color

Color options are shown in **Figure 5-3**.

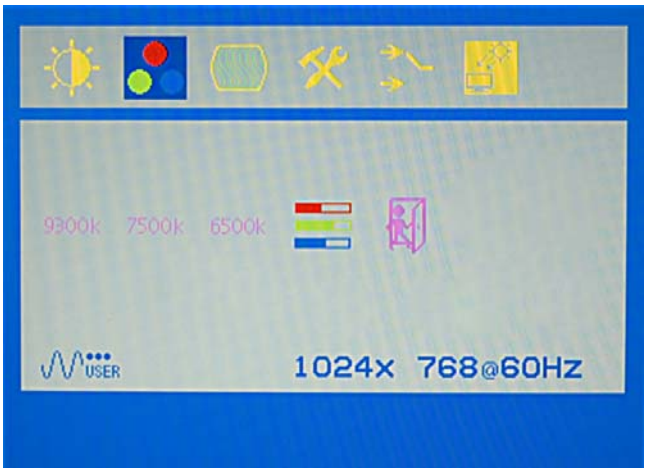


Figure 5-3: Color Options

The Color menu fine-tunes the palette of color hues for the LCD.

9300k	**9300k**	NTSC standard Kelvin
7500k	**7500k**	NTSC standard Kelvin
6500k	**6500k**	NTSC standard Kelvin
	User Temp	This item allows fine-tuning the balance among Red, Green, and Blue color hues if images look garish or unrealistic.

5.2.3 Image Settings

The image settings are shown in **Figure 5-4**.

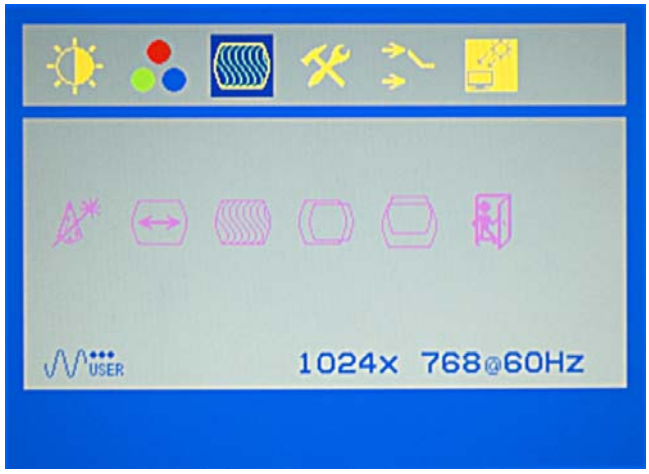


Figure 5-4: Image Settings Menu

Image settings are described below.

	Auto Color	Automatically adjusts the color settings.
	Width	Adjusts the width of the display screen.
	Phase	Adjusts the input signal and dot clock position (Analog only)
	H. Position	Adjusts the horizontal position of the display screen.
	V. Position	Adjusts the vertical position of the display screen

5.2.4 OSD Configurations

The OSD configurations are shown in **Figure 5-5**.

Figure 5-5: OSD Configurations Menu

OSD Configurations are described below.

OSD Time Out	Determines how many seconds the OSD screen stays on screen before it disappears when OSD is left unattended.
OSD Position	Adjusts the OSD position on the screen. Position 1 is in the upper left of the screen, position 2 in the upper right and position 3 in the center.
Factory Reset	Restores the default OSD settings. Note that this will restore all default display settings.

5.2.5 Signal

The Signal menu in **Figure 5-6** enables manual selection of the type of graphic source input:

	Analog	15-pin VGA
	Digital	DVI-D

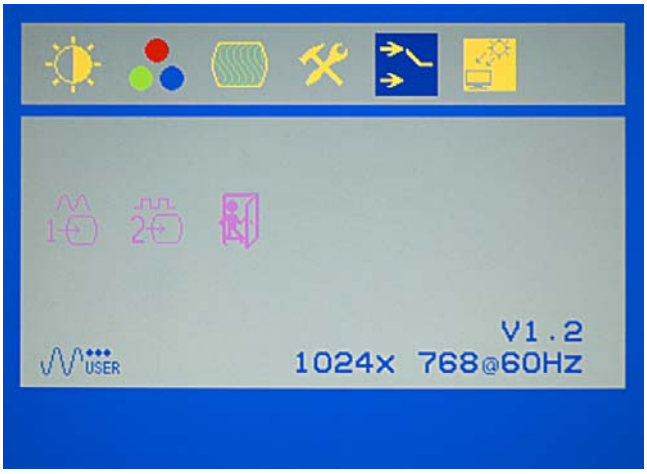


Figure 5-6: Signal Menu

5.2.6 Auto-Dimming Configurations

The SRM-KIT industrial monitor features an auto-dimming LCD that can automatically adjust the backlight brightness according to the ambient light. If the auto-dimming function is turned on, the backlight turns brighter when the ambient illuminance is high. The backlight dims automatically when the ambient brightness level is low.

The SI unit of illuminance is “lux”. Lux measures the intensity of light. **Table 5-2** lists the illuminance (LUX measurement) of everyday light sources.

Light Source	Brightness (LUX)
Night without moonlight	<10
Night with moonlight	<100
Office desk lighting	500~1000
Overcast day	1000~2000
Sunny day	10,000
Direct sunlight	100,000

Table 5-2: LUX Measurement of Everyday Light Source

5.2.6.1 Default Settings

The auto-dimming default settings of the SRM-KIT industrial monitor are listed in **Table 5-3** below:

OSD	Default Settings	Description
Light Min	0	Minimum backlight value Unit in percentage (%)
Light Max	100	Maximum backlight value Unit in percentage (%)
LUX Min	0	Minimum ambient brightness Unit in 100 lux
LUX Max	52	Maximum ambient brightness Unit in 100 lux (52=5200 lux)

Table 5-3: Auto-Dimming Default Settings

The **Figure 5-7** shows the SRM-KIT121G default linearity of the LCD backlight and ambient light. When the sensor detects the ambient illuminance as 5200 LUX or above, the SRM-KIT series industrial monitor adjusts the LCD brightness to 100%.

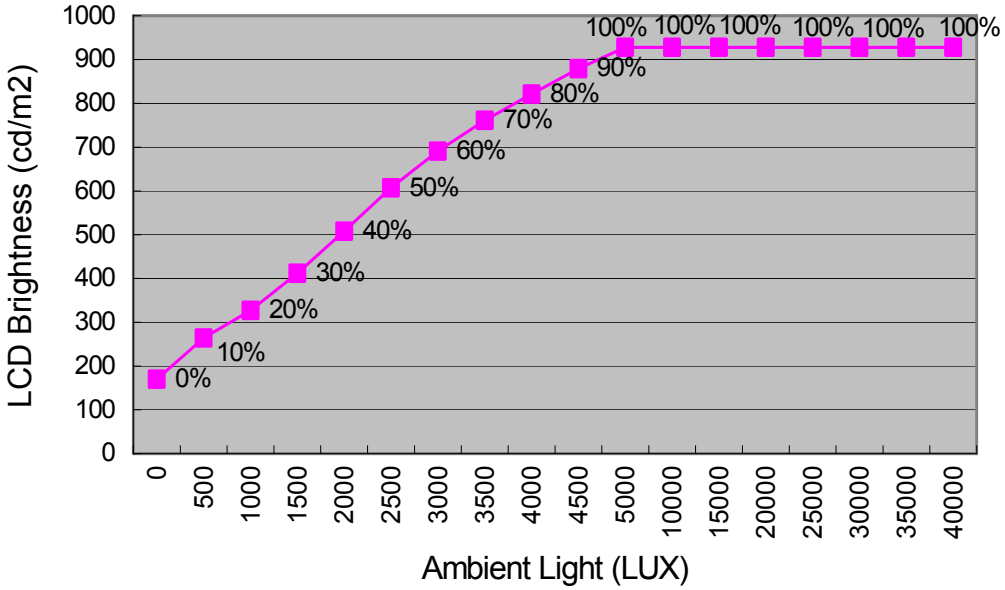


Figure 5-7: SRM-KIT121G Default Linearity of the LCD Backlight and Ambient Light

5.2.6.2 OSD Control

The auto-dimming configurations are shown in **Figure 5-5**.

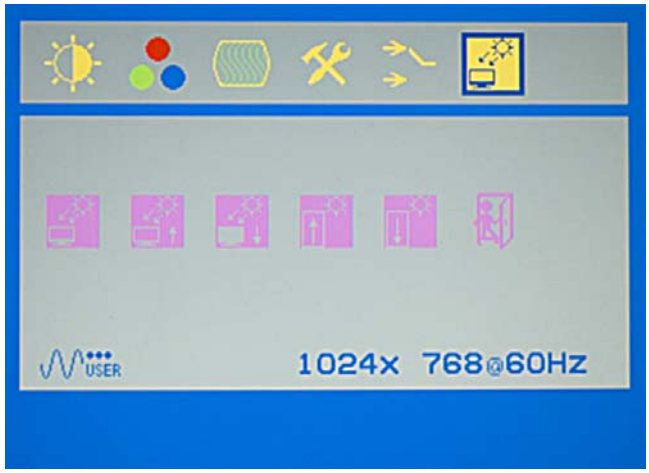


Figure 5-8: Auto-Dimming Configurations Menu

Auto-Dimming Configurations are described below.

Light Enable ON/OFF	Turn on or turn off auto-dimming function. When auto-dimming is turned on, the auto-dimming LED on the OSD panel is on and the monitor automatically adjusts the brightness according to ambient light conditions.
Light Max	Adjusts the maximum LCD brightness value. The value is from 0% to 100%. The value cannot be smaller than the minimum LCD brightness value.
Light Min	Adjusts the minimum LCD brightness value. The value is among 0% to 100%. The value cannot be larger than the maximum LCD brightness value.
LUX Max	Adjusts the maximum LUX. The value is from 0 to 400 (40,000 LUX). The value cannot be smaller than the minimum LUX.
LUX Min	Adjusts the minimum LUX. The value is from 0 to 400 (40,000 LUX). The value cannot be larger than the maximum LUX.

5.2.6.3 Changing the Default Settings

The maximum and minimum LUX value and backlight brightness in the OSD panel can be adjusted to meet custom needs and lighting conditions.

NOTE:

When the auto dimming function is on, the “Brightness Control” in main display feature (refer to **Section 5.2.1**) is not effective. The user can only adjust the maximum and minimum value of the LUX and backlight to make the LCD brighter or darker.

Light Max. and Light Min.

To keep the LCD brightness within a specific range, not the 0~100% wide range, adjust the minimum and maximum value of the LCD backlight. For example, set the Light Min. to 30 and the Light Max. to 70. Then, the adjustable LCD brightness range is among 30% to 70%. By doing this, the LCD brightness does not become too bright or too dark if the ambient light reaches the default maximum or minimum value.

LUX Max. and LUX Min.

The SRM-KIT series is an ideal product for outdoor display. However, if the SRM-KIT series is installed in an environment with stable and low lux lighting, the LCD monitor cannot detect the default maximum lux (5200 lux) and make the LCD brightness reach to the maximum. To set the LCD brightness to the maximum value, the user can adjust the default maximum lux value.

For example, in a low lux office desk lighting environment, the default lux maximum value may be adjusted from 52 (5200 lux) to 4 (400 lux). Once the setting is changed, the monitor detects the ambient light and increases the LCD brightness to the maximum (**Figure 5-9**). In this case, the LCD brightness increases in a low lux environment by decreasing the maximum LUX value while keeping other settings in default (**Figure 5-10**).

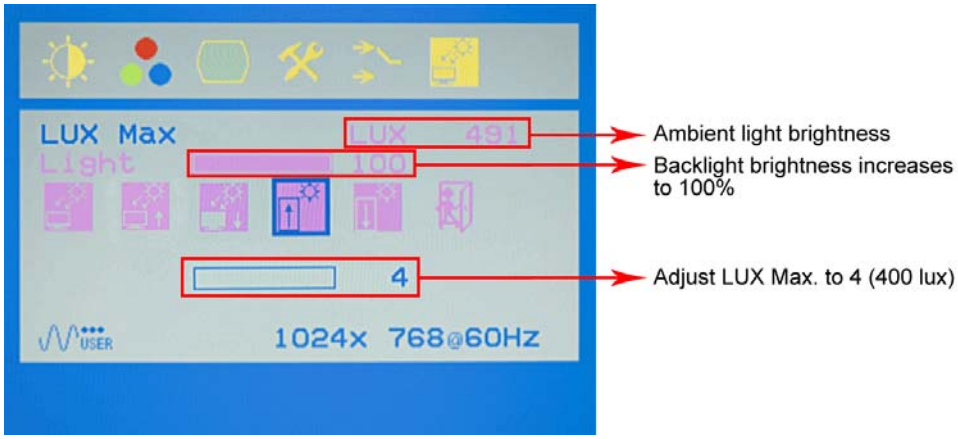
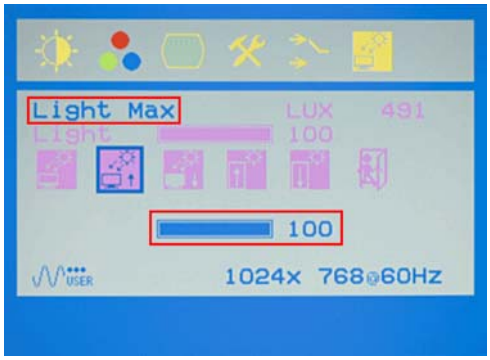
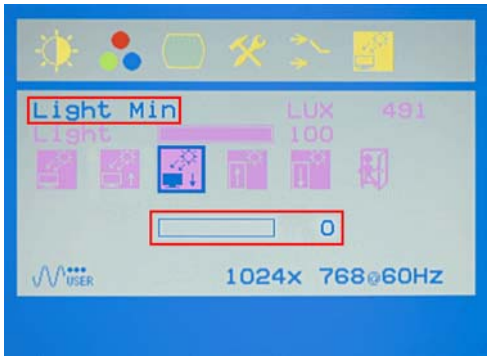


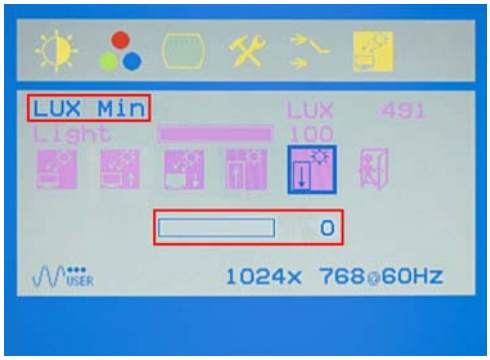
Figure 5-9: Decreasing LUX Max. Value



Keep Light Max. in default setting: 100



Keep Light Min. in default setting: 0



Keep LUX Min. in default setting: 0

Figure 5-10: Light Max, Light Min and LUX Min in Default Value

Appendix

A

Certification

A.1 RoHS Compliant

All models in the SRM-KIT LCD monitor series comply with the Restriction of Hazardous Materials (RoHS) Directive. This means that all components used to build the industrial workstations and the workstation itself are RoHS compliant.

The RoHS Directive bans the placing on the EU market of new electrical and electronic equipment containing more than agreed levels of lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyl (PBB) and polybrominated diphenyl ether (PBDE) flame retardants.

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